Saskatchewan

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FINAL REPORT

BREEDING FIELD PEA CULTIVARS FOR SASKATCHEWAN

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1999 FINAL REPORT TO THE SASKATCHEWAN AGRICULTURE DEVELOPMENT FUND

Breeding Field Pea Cultivars for Saskatchewan

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Field pea has become a very important commodity for the Canadian, and especially for the Saskatchewan economy. This crop has experienced a tremendous increase in area of production of 950% during the last decade, particularly in the province of Saskatchewan, where 72% of the Canadian field pea crop (2.1 million acres) was grown in 1999.

Field pea breeding efforts in Western Canada were initiated by Agriculture and Agri-Food Canada at Morden, MB, in 1960; and by the University of Saskatchewan (Crop Development Centre, CDC) at Saskatoon, SK, in 1972. The objective of these two breeding programs is to develop food and feed types of field pea cultivars for the Canadian prairies. For both types, high yielding ability, lodging resistance, disease resistance and early maturity are important goals.

Funds were received from Saskatchewan Agriculture Development Fund (ADF) for a five year period, beginning in 1995, to support the field pea breeding effort in Saskatchewan, which has been a great asset to the Morden and Saskatoon breeding programs, allowing them to expand and accelerate their research.

During the five year period a total of 1249 field pea breeding lines were evaluated (Table 1). AAFC (Morden) lines were evaluated at Wadena, SK, the first two years and at Scott, SK, the last three years, while CDC (Saskatoon) lines were evaluated at Melfort in all five years.

Table 1. Number of field pea breeding lines tested by the AAFC (Morden) and the CDC (Saskatoon) programs during the period 1995-1999.

Breeding Program	Year					Total
	1995	1996	1997	1998	1999	
AAFC	96	99	80	83	117	475
CDC	110	130	125	128	81	574
Total	206	229	205	211	198	1249

Each year, results from these experiments were combined with data from other sites in order to select first year entries for the Field Pea Co-operative Test (FPCT). Results from experiments grown at Melfort and Scott in 1999 are found in Appendix A and B, respectively.

Field pea cultivars supported for registration in recent years are summarized in Table 2. Funding from ADF assisted in the development of these cultivars.

Table 2. Field pea cultivars developed by the Crop Development Centre (CDC) and the Morden Research Centre (MRC) in recent years.

Cultivar	Year of support for registration	Breeder	Features*
CDC Mozart	1999	CDC	Yield, PMR, Y
CDC Handel	1999	CDC	Yield, PMR, Y
CDC Verdi	1999	CDC	Yield, Bleach resistance, G
CDC 9801	2000	CDC	Yield, PMR, G
CDC 9805	2000	CDC	Yield, Small seed size, PMR, Y
AC Melfort	1998	MRC	Yield, PMR, Y
MP1407	1999	MRC	Yield, PMR, G
DS Stalwarth	1999	MRC/Danisco Seed	Yield, PMR, Y
DS 49310	2000	MRC/Danisco Seed	Yield, PMR, Lodg res, G
DS 49376	2000	MRC/Danisco Seed	Yield, PMR, Lodg res, Y

*Abbreviations:
PMR=powdery mildew resistance
Y=yellow cotyledon color
G=green cotyledon color
Lodg res=Improved lodging resistance

APPENDIX A

Table 4. CDC (Saskatoon) Pea Advanced Test No.1 - Melfort, 1999

Entry	Name	Yield (kg/ha)	Days to flower	Days to maturity	Heigh (cm)	Lodging (1-9) Early	Late
1	Keoma	3674	51	93	105	2.5	6.5
2	Espace	3761	52	97	92	1.0	5.0
3	Explorer	2397	54	98	111	2.0	5.0
4	CDC 9710	2928	57	102	97	1.5	5.0
5	SW93605	2662	54	99	112	1.0	5.5
6	CDC 9801	3183	56	100	110	2.0	4.5
7	352-17-G-1	2644	56	106	110	1.5	5.5
8	349R-1-G-4	2636	53	94	105	2.0	5.5
9	349R-1-G-12	3324	54	97	110	1.5	5.0
10	475F2-G-7	3223	54	100	106	1.5	5.5
11	365-G-35	3295	56	102	111	2.0	3.5
12	365-G-36	3309	56	102	118	1.5	5.0
13	365-G-37	2419	59	111	106	1.5	4.0
14	444-G-1	2480	51	104	112	2.0	5.0
15	402-G-10	3589	52	93	92	1.0	7.5
16	402-G-16	3128	52	100	103	2.0	5.5
17	402-G-17	3149	51	94	108	1.5	5.5
18	378-G-2	2568	57	95	96	2.5	6.0
19	406-G-1	3327	52	93	100	2.0	5.0
20	406-G-3	3306	56	97	113	1.5	5.0
21	406-G-8	3466	52	97	110	1.5	5.5
22	406-G-9	2160	60	104	115	2.0	5.0
23	406-G-10	3440	59	105	118	1.5	4.5
24	406-G-11	3276	52	96	110	2.0	5.0
25	351-1-G-8	3059	52	100	102	1.0	5.0
26	400-G-8	3638	54	96	108	2.0	5.5
27	349R-9-G-4	3100	52	100	98	1.5	6.5
28	349R-9-G-5	2453	56	104	90	1.5	5.5
29	349R-9-G-12	3070	52	102	98	1.0	5.5
30	349R-11-G-3	3020	52	96	96	2.0	7.0
31	434a-d-G-2	3180	53	98	108	2.5	5.5
32	434a-d-G-5	3580	52	97	126	2.0	4.0
33	434a-d-G-9	2826	52	100	102	2.0	6.0
34	465-G-19	2689	58	104	112	2.0	4.5
35	465-G-20	2098	58	102	115	1.5	5.0
36	445-G-1	2891	53	96	102	1.0	5.5
	Mean	**2998**	**54**	**99**	**106**	**1.7**	**5.3**
	CV %	**13.4**	**1.4**	**1.7**	**7.0**	**22.1**	**9.6**
	LSD	**825**	**1.5**	**3.5**	**15.4**	**0.8**	**1.1**

Table 5. CDC (Saskatoon) Pea Elite Test No.1 - Melfort, 1999

Entry	Name	Yield (kg/ha)	Days to flower	Days to maturity	Height (cm)	Lodging (1-9) Early	Lodging (1-9) Late
1	Grande	3015	56	100	99	2.0	4.0
2	9705	3763	52	102	121	1.0	5.5
3	9704	3040	54	100	111	2.0	5.5
4	Carneval	2872	55	99	115	1.5	4.0
5	Espace	3992	53	100	105	1.0	4.5
6	Explorer	3077	54	97	118	2.5	5.0
7	9710	2851	57	102	108	2.0	4.5
8	9801	2355	58	105	123	2.0	5.0
9	9803	2394	56	100	116	2.5	5.0
10	9805	3439	58	100	111	2.0	5.0
11	9809	2466	56	106	124	2.0	4.5
12	9901	1129	59	114	140	2.0	5.0
13	9902	1780	59	110	99	1.5	5.0
14	9903	2424	56	103	120	2.0	4.5
15	9904	2111	52	110	120	2.0	4.5
16	9905	2511	58	107	110	2.0	5.0
17	9906	3796	54	95	99	2.0	5.5
18	9907	2481	54	100	105	1.0	5.0
19	9908	1704	58	112	105	1.5	4.5
20	9909	1060	59	114	120	2.0	4.0
21	9910	1814	56	114	126	2.0	4.0
22	F12-7	3361	55	98	113	1.5	5.5
23	Delta	3039	55	111	111	1.5	5.0
24	F13-32	3288	51	118	118	1.5	5.0
25	F22-1	3208	52	106	106	1.0	4.5
26	F25-3	3254	56	110	110	2.0	5.0
27	203PMR-14G	1888	58	120	120	1.5	4.0
28	M232-16G	1263	56	89	89	1.5	4.5
29	M251-2YG	2199	56	115	115	1.0	5.0
30	177-8G	2506	52	113	113	2.0	6.0
31	203PMR-18G	2387	55	104	104	1.5	4.5
32	209-7Y	2863	54	123	123	2.0	4.5
33	198SL-7Y	2969	54	104	104	2.0	5.0
34	M284-33Y	2022	56	122	122	2.0	5.0
35	195SL-19Y	2101	58	104	104	1.5	4.5
36	198-21Y	2794	55	98	98	2.0	5.0
	Mean	**2589**	**55**	**103**	**112**	**1.8**	**4.8**
	CV %	**12.6**	**1.2**	**1.6**	**7.4**	**26.0**	**9.8**
	LSD	**674**	**1.4**	**3.5**	**17.1**	**0.9**	**1.0**

Table 6. CDC (Saskatoon) Pea Elite Test No.2 - Melfort, 1999

Entry	Name	Yield (kg/ha)	Days to flower	Days to maturity	Height (cm)	Lodging (1-9)	
						Early	Late
1	Grande	2746	56	100	128	2.0	5.0
2	Carneval	3599	52	102	102	1.5	5.5
3	Espace	2784	55	100	116	1.0	4.0
4	Keoma	3915	51	94	96	1.0	5.5
5	Alfetta	2785	53	100	113	2.0	5.0
6	MP 1373	2379	56	100	130	1.0	4.5
7	Eiffel	1289	59	107	100	1.5	5.0
8	LG110	969	59	113	106	2.5	5.0
9	Princess	2173	55	110	98	1.0	5.0
10	169-SL-8-G	2804	54	103	105	1.5	4.5
11	183-1-Y	3408	53	96	93	2.0	5.5
12	161-SL-7-G	2339	55	104	118	2.0	4.5
13	161-SL-11-G	2388	56	107	110	2.0	5.0
14	157-2-G	1181	62	114	115	1.0	4.0
15	9703	2595	54	100	112	1.0	4.5
16	9701	2912	52	106	116	2.0	4.5
17	9708	2578	55	104	121	1.5	4.0
18	9709	2816	53	104	131	2.0	4.5
	Mean	**2537**	**55**	**103**	**112**	**1.6**	**4.8**
	CV %	**16.8**	**1.3**	**2.2**	**9.4**	**24.1**	**9.0**
	LSD	**899**	**1.5**	**4.8**	**22.2**	**0.8**	**0.9**

Table 7. CDC (Saskatoon) Maple Pea Elite Test No. 2 - Melfort, 1999

Entry	Name	Yield (kg/ha)	Days to flower	Days to maturity	Height (cm)	Lodging (1-9)	
						Early	Late
1	Whero	1712	59	104	164	2.5	5.5
2	Johnson	2024	58	105	126	2.5	4.0
3	9705	3323	52	102	120	1.5	5.0
4	Carneval	3572	55	99	120	1.5	4.0
5	Grande	2860	57	104	126	2.0	4.5
6	Courier	2368	58	105	106	2.0	4.5
7	Alfetta	4651	51	98	108	1.0	5.5
8	203-4M	1859	56	109	108	1.0	5.0
9	203-6M	581	62	111	127	2.5	5.0
10	Vienna	2166	58	107	114	1.5	5.0
11	203PMR-16M	1736	60	111	122	2.5	4.0
12	204-14	2163	55	110	104	2.5	5.0
13	264-13M	1655	59	110	133	1.5	4.5
14	203-12M	2302	61	107	122	2.0	4.5
15	M256-2M	949	56	100	113	2.5	6.5
16	M262-5M	1089	53	108	108	2.0	4.5
17	264-76M	1471	59	108	101	1.5	4.5
18	264-38M	2387	60	106	108	2.0	4.5
	Mean	**2159**	**57**	**105**	**118**	**1.9**	**4.8**
	CV %	**11.0**	**1.5**	**2.3**	**8.7**	**29.0**	**13.0**
	LSD	**500**	**1.8**	**5.1**	**21.6**	**1.2**	**1.3**

APPENDIX B

Table 8. AAFC (Morden) Pea Joint Test - Scott, 1999

Entry	Name	Yield (kg/ha)	Days to flower	Days to maturity	Height (cm)	Lodging (1-9)	
						Early	Late
1	Carrera	4736	64	109	48	1.0	6.0
2	Carneval	4904	71	110	70	1.0	1.5
3	CDC9705	4240	64	108	52	1.0	6.0
4	Keoma	4258	64	110	62	1.0	5.5
5	MP1749	4009	72	110	75	1.0	2.5
6	9410042	4924	66	109	75	1.0	2.5
7	9406046	4482	66	110	70	1.0	3.0
8	9407021	4544	70	111	68	1.0	4.5
9	9408017	5024	70	109	78	1.0	4.5
10	9410001	4503	65	108	52	1.0	4.0
11	9411050	4599	72	111	80	1.0	7.0
12	9411076	4109	68	108	65	1.0	4.5
13	9411078	4457	72	111	68	1.0	3.5
14	9411093	4751	71	110	78	1.0	5.5
15	9411097	4490	70	109	62	1.0	5.0
16	9413011	4015	70	109	65	1.0	2.0
17	9413019	4544	68	109	68	1.0	2.5
18	9413038	4699	69	110	65	1.0	2.0
19	9415002	4139	68	110	78	1.0	7.0
20	9416016	4293	66	110	62	1.0	4.0
21	9427008	3880	69	110	68	1.0	2.5
22	9434037	4685	64	108	78	1.0	4.0
23	9311111	4397	72	110	92	1.0	4.5
24	DS49360	5193	64	109	70	1.0	1.5
	Mean	**4495**	**68**	**109**	**69**	**1.0**	**3.9**
	CV	**11.1**	**0.7**	**0.8**	**13.1**	**0.0**	**48.0**
	LSD	**1031**	**1.1**	**1.8**	**18.6**	**0.0**	**3.9**

Notes:
Lodging: 1=upright, 9=flat

Table 9. AAFC (Morden) Pea Network Test No.1 - Scott, 1999

Entry	Name	Yield (kg/ha)	Days to flower	Days to maturity	Height (cm)	Lodging (1-9)	
						Early	Late
1	Carrera	5414	64	110	58	1.0	6.5
2	Carneval	5265	70	110	85	1.0	4.0
3	CDC9705	4937	65	109	65	1.0	6.5
4	9404068	4589	64	110	65	1.0	2.0
5	9430006	4246	72	112	62	1.0	7.0
6	9406007	4850	68	110	78	1.0	7.5
7	9406030	5107	64	109	72	1.0	1.0
8	9407005	5137	62	106	68	1.0	4.0
9	9408042	4092	72	112	78	1.0	9.0
10	9410037	5160	67	108	65	1.0	4.5
11	9411010	4381	68	110	75	1.0	5.5
12	9411034	4488	71	112	82	1.0	4.0
13	9411052	3761	71	114	78	1.0	6.0
14	9411057	4548	68	109	70	1.0	5.0
15	9413043	3583	64	108	55	1.0	6.5
16	9414057	3378	70	110	78	1.0	5.5
17	9415001	4723	71	109	85	1.0	2.5
18	9415054	4592	72	112	90	1.0	7.0
19	9416003	4587	70	110	70	1.0	4.0
20	9417008	4356	66	113	75	1.0	3.5
21	9424001	5225	72	110	92	1.0	4.0
22	9440019	5189	71	111	82	1.0	5.5
23	9430004	3650	71	113	90	1.0	6.5
24	9306126	4867	72	113	90	1.0	8.5
25	9309077	5030	66	110	75	1.0	1.5
26	9401055	5282	70	110	65	1.0	4.5
27	9402033	5119	63	107	60	1.0	2.0
28	9404016	5125	64	109	82	1.0	5.0
29	9404112	4386	68	110	70	1.0	5.5
30	9411108	4758	72	114	92	1.0	9.0
31	9441006	4624	66	112	82	1.0	6.5
32	4-0479.034	5040	68	110	90	1.0	2.5
33	4-0743.114	5155	62	110	72	1.0	2.5
34	4-0783.036	5798	64	109	60	1.0	7.5
35	4-0831.076	5247	68	109	68	1.0	3.0
36	9524031	4518	72	112	95	1.0	4.0
	Mean	**4728**	**68**	**110**	**76**	**1.0**	**5.0**
	CV	**10.3**	**1.1**	**1.0**	**5.5**	**0.0**	**30.7**
	LSD	**999**	**1.5**	**2.4**	**8.6**	**0.0**	**3.2**

Notes:
Lodging: 1=upright, 9=flat

Table 10. AAFC (Morden) Pea Network Test No.2 - Scott, 1999

Entry	Name	Yield (kg/ha)	Days to flower	Days to maturity	Height (cm)	Lodging (1-9)	
						Early	Late
1	Carrera	4792	64	109	52	1.0	7.0
2	Carneval	4725	70	109	72	1.0	1.5
3	CDC9705	5280	65	110	68	1.0	4.0
4	9524033	4415	72	110	92	1.0	1.5
5	9524043	4400	72	111	90	1.0	4.0
6	9524059	4621	73	113	90	1.0	1.5
7	9524064	4286	72	112	90	1.0	2.0
8	9525003	4399	72	114	65	1.0	4.5
9	9525025	4044	71	114	73	1.0	5.5
10	9525053	4184	74	114	72	1.0	7.5
11	9526010	4284	71	111	78	1.0	3.5
12	9526022	4790	72	112	82	1.0	3.5
13	9528065	3557	73	112	65	1.0	5.0
14	9528066	4328	71	112	65	1.0	8.0
15	9529008	3862	73	114	90	1.0	8.0
16	9529010	3880	72	113	55	1.0	3.5
17	9528014	4020	74	112	75	1.0	2.0
18	9529016	3392	74	114	82	1.0	4.0
19	9529017	3561	74	114	68	1.0	3.5
20	9529026	3542	70	112	68	1.0	6.0
21	9529040	3881	74	114	75	1.0	4.5
22	9531010	3708	73	112	65	1.0	6.5
23	9531017	4456	72	111	80	1.0	1.5
24	9531023	3512	74	113	88	1.0	5.0
25	9531026	4180	72	114	88	1.0	6.5
26	9531028	4337	74	114	80	1.0	2.0
27	9531034	3776	74	114	90	1.0	6.5
28	9531045	3425	72	114	60	1.0	7.5
29	9531053	3850	73	114	78	1.0	7.5
30	9531058	3507	72	114	62	1.0	7.0
31	9534020	3521	72	114	85	1.0	5.0
32	9534026	3546	73	112	82	1.0	2.5
33	9557015	4363	72	110	85	1.0	4.0
34	9557016	3992	74	113	95	1.0	5.5
35	9557018	4551	73	112	98	1.0	2.5
36	9557020	4557	68	109	68	1.0	3.5
	Mean	**4098**	**72**	**112**	**77**	**1.0**	**4.5**
	CV	**7.3**	**0.7**	**1.0**	**5.3**	**0.0**	**37.6**
	LSD	**613**	**1.1**	**2.3**	**8.4**	**0.0**	**3.5**

Notes:
Lodging: 1=upright, 9=flat

Table 11. AAFC (Morden) Pea Network Test No.5 - Scott, 1999

Entry	Name	Yield (kg/ha)	Days to flower	Days to maturity	Height (cm)	Lodging (1-9)	
						Early	Late
1	Carrera	5108	64	108	50	1.0	6.5
2	Carneval	5227	70	111	72	1.0	1.0
3	CDC9705	4488	64	108	52	1.0	4.0
4	Keoma	4459	63	108	52	1.0	5.5
5	9517022	3957	62	114	60	1.0	4.5
6	9517053	3651	66	111	55	1.0	5.0
7	9518026	3642	68	114	72	1.0	2.5
8	9520003	2998	70	115	70	1.0	8.0
9	9520008	2732	72	114	70	1.0	5.0
10	9520010	2574	70	114	70	1.0	8.5
11	9521001	3756	71	114	55	1.0	6.5
12	9523002	3235	69	112	60	1.0	6.0
13	9523010	3104	72	115	65	1.0	3.5
14	9523013	2896	69	115	68	1.0	5.0
15	9523019	3030	68	112	62	1.0	6.0
16	9523021	2873	72	114	62	1.0	3.0
17	9523025	2659	68	114	70	1.0	6.5
18	9523026	3354	70	114	78	1.0	7.5
19	9523029	3535	69	113	72	1.0	5.0
20	9523030	3196	70	114	68	1.0	5.0
21	9523031	3115	71	114	70	1.0	6.0
22	9523033	3432	70	114	70	1.0	6.0
23	9523034	3170	70	112	70	1.0	4.5
24	9523041	1571	70	115	60	1.0	9.0
25	9556003	3859	65	112	62	1.0	5.5
26	9570010	3513	70	114	78	1.0	4.0
27	9574024	4347	63	108	65	1.0	4.0
28	9575002	4224	70	108	62	1.0	6.5
29	9575006	3166	70	112	52	1.0	7.5
30	9575009	4103	72	110	65	1.0	7.5
31	9575011	3453	72	112	62	1.0	7.5
32	9575012	4219	71	109	62	1.0	8.0
33	9575018	4025	71	112	68	1.0	9.0
34	9575027	3993	72	110	52	1.0	8.5
35	4-0862.002-1	3161	72	114	50	1.0	7.0
36	9427004	4397	71	109	72	1.0	2.0
	Mean	3561	69	112	64	1.0	5.8
	CV	7.9	1.1	1.2	6.6	0.0	25.9
	LSD	579	1.6	2.8	8.8	0.0	3.1

Notes:
Lodging: 1=upright, 9=flat